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The acts of diagnosis described in this paper aid in the determination of relevant, material, and consequential factors in a clinical study. These acts, which are not necessarily sequential, are identification, assumption, rejection, acceptance, discovery, explanation, prediction, and verification. The clinician with this model in mind will be able to determine more objectively what is relevant, material, and consequential. Insignificant details can be swept aside, and a clear-cut sequence of factors leading to the disability can become apparent. All of this should be completed before treatment and instructional measures are initiated. An illustrative case study is reported. (Author/BS)

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RE001 301

DETERMINING CONSEQUENTIAL FACTORS IN DIAGNOSIS

Session: Evaluation: Diagnostic Techniques

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In the clinical study of a disabled reader, numerous facts from various sources are obtained. Many of these have little, if any, significance in determining diagnosis or treatment of a particular individual. It is the purpose

of this paper to set forth the dynamics involved in determining what factors in the study are relevant, material, and consequential. A factor is relevant if it is related to the immediate problem. As more is learned concerning the total situation, this factor may become material and essential to the diagnosis of the disability. Further study may show that the factor is consequential and leads to the effect or maladjustment under investigation. Obviously, this evaluation of relevant factors is essential to diagnosis.

Definition of Diagnosis

Diagnosis, as applied in this paper, is an explanation of an individual's maladjustment in reading. In the study of the disabled reader the teacher and clinician are concerned with cause which precedes an event called the effect. This may not be an invariable sequence but a probability of a specific occurrence. In general, causation is multiple, however, in individual cases a single factor can set off a chain reaction of several factors which are contributory and material to the disability. A car, for example, failed to start

when the temperature was five degrees below zero. Upon investigation it was found that the battery was partially discharged, that the oil in the crankcase was of 30 viscosity, that the motor had not been tuned for nearly a year, and that the spark plugs were three years old. After standing for several hours in a warm garage, it started without difficulty. The low temperature was the consequential determinant which triggered a sequence of various factors which in turn led directly to the difficulty in starting the car. Cause led to effect.

Levels of Diagnosis

Diagnosis can be made at any one of four levels and with varying degrees of competency. These are illustrated in the accompanying chart. The first and lowest is merely identification of the problem. At this level, it is only pointed out that the child's difficulty in the classroom is due to the fact that he cannot read. He is merely identified as a non reader. At the second level, classification, the problem is explained in some detail. It may show, for example,

that a sixth grade student is reading at second grade level (2.0) and is classified as a secondary reading problem who is penalized because of his disability. The chief characteristics of this level of diagnosis are measurement, description, and classification. At the third level, determination of needs, the reading deficiencies of the individual are identified. It is shown, for example, that the person needs to learn how to read for a purpose, how to read for main ideas, and how to make ideas his own. The inferences may be based upon the use of observational procedures, informal inventories, interviewing techniques, and tests. In all instances the reading needs of the individual have been determined. The competent and experienced classroom teacher will be able to make a diagnosis at this level. The fourth and highest level of diagnosis involves the identification of causal factors. The chief objective is to determine why the individual is having difficulty in reading. In the diagnosis of an individual at this level, there frequently is need for cooperation with others trained in such fields as pediatrics, ophthalmology, otology, neurology, psychology, and sociology. It is the

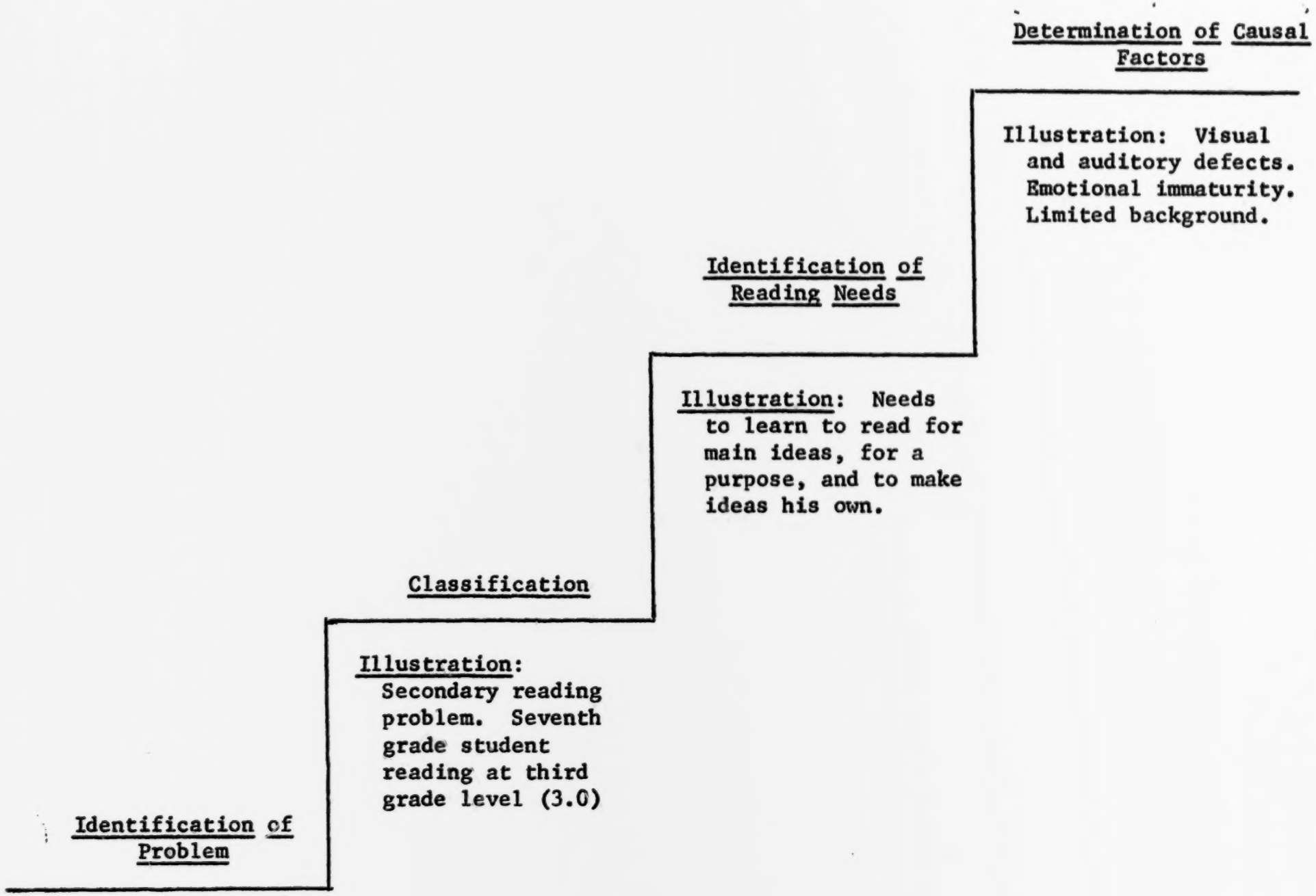
Determination of Causal Factors
Illustration: Visual and auditory defects. Emotional immaturity. Limited background.
Identification of Reading Needs
Illustration: Needs to learn to read for main ideas, for a purpose, and to make ideas his own.
Classification
Illustration: Secondary reading problem. Seventh grade student reading at third grade level (3.0)
Identification of Problem
Illustration: Non reader.

Figure 1
Levels of Diagnosis Shown on a Schematic Scale

responsibility of the reading clinician to arrange for referrals or cooperative study. He should not attempt to muddle through alone.

Criteria of Effective Diagnosis

The principles of diagnosis in the field of reading are identical with the fundamental laws of diagnosis in other clinical fields. Back of every behavior pattern, there are material and consequential factors which are causal in nature. The process of diagnosis becomes effective when it is carried out on a background of scientific investigation and according to principles generally accepted by students of human behavior in various disciplines. Some of these are:

* The importance of causal factors is dependent upon the degree to which they modify and affect reading performance. They are not all of equal significance.

* The individual should always be studied as a whole, relating

disorders of parts to the pattern of the whole personality. This is especially true in the study of the disabled reader for reading is an act of the total organism.

* Simple interpretations of the individual's behavior should have preference over the more complex. If one explanation is sufficient, all others are superficial.

* It is always necessary to recognize the possibility of several diagnosis which must be differentiated. Is the disability, for example, due to mental retardation or to a lack of experiential background?

* Diagnosis must be scientifically oriented if it is to become the cornerstone of clinical study and the basis of treatment.

These principles, important as they are, need to be applied by a clinician with extensive mental content and experiential background. He must be a master teacher and be able to apply effectively information from the life sciences. He must have both theoretical and practical training with reading performance at all levels. His educational background should make him both scientific in his diagnosis and creative in his treatment. He should have experience in the classroom, in a reading clinic, child guidance center, and in a hospital for mentally retarded and emotionally disturbed children. He should "hear, read, mark, learn and inwardly digest" contemporary research and progress from a "mental tester" to a competent reading clinician.

Acts of Diagnosis

As in all problem solving activities, diagnosis depends upon the identification of the immediate problem and all of the relevant variables. The greatest difficulty in diagnosis consists in discovering the true nature of the problem. In achieving this objective the clinician must be aware of possible etiological

factors in order to identify the determinants affecting the disability. The whole process of diagnosis at the fourth level can be brought to a sharp focus if the following acts can be utilized systematically.

* Identify the problem and possible causal factors.

* Assume and reject "hunch" after "hunch" until one can be accepted tentatively.

* Discover possible determinant and explain consequential relationship.

* Predict that with treatment the disability will be overcome. The clinician must verify this prediction.

These acts in some instances may vary in order and sequence. They are, however, an integral part of every complete diagnosis and are a means of determining that which is only relevant, that which is material,

and that which is consequential. At this point, it is advisable to apply these acts in the diagnosis of an actual reading disability.

Lee is a twelve-year-old boy of high average intelligence whose achievement in the language arts is far below the expected level. His teacher reports that he has difficulty in identifying and interpreting unfamiliar words and that his use of contextual clues is greatly overworked. Lee who is in the sixth grade has attended schools in three states and two foreign countries. His major interests are music and sports. He is the only child of professional parents. In his bilingual home the father is frequently away for weeks at a time, and mother is busily engaged in teaching. Lee is well liked by his associates and has been elected president of the sixth grade class. Physical growth and development are reported as quite satisfactory. His grade equivalent score in reading is that of a child four months in the third grade (3.4). His independent, instructional, frustration, and capacity levels in reading are 1, 2, 3, and 7, respectively.

The problem briefly stated is, "Why is Lee reading so far below his expected level?"

The reading clinician after studying the known facts has assumed several "hunches." They are:

* The bilingual home background is a causal factor.

* The frequent change in schools is related to the disability in reading.

* Inadequate instruction is a possible cause.

* The home has failed to provide adequate background and guidance.

* Lee is frustrated and unwilling to put forth and sustain effort.

Each of these hypotheses represents a constellation of factors which must be evaluated so as to determine whether or not the configuration is relevant, material, or consequential. As a result of this evaluation, it was

the consensus that the bilingual home and the failure of the home to provide adequate background and guidance were only relevant and that the frequent change in schools was a likely explanation of Lee's maladjustment in reading. Furthermore, it was assumed that Lee's difficulty in identifying and interpreting words was a material fact which was essential to the diagnosis. It was, however, not consequential. In a further study of the history it was discovered that Lee had repeatedly changed from the analytical to the synthetical approach to word recognition. Consequently, the confusion led to frustration and inability to learn. As a result of this discovery and explanation, it was assumed that the change from school to school was a consequential factor leading directly to the effect, Lee's inability to make progress in reading. It was hypothesized then that Lee's frustration and unwillingness to put forth and sustain effort were both relevant and contributory. The clinician and his associates then predicted that if the reading therapist and the classroom teacher employed a consistent approach to word study, Lee's frustration would be reduced and learning would be more satisfying and effective. Materials of interest to

Lee were selected which had a readability level at approximately the second grade. He was given praise and commendation whenever justly deserved. These measures were only palliative in nature. Both reading and spelling vocabularies were built up by means of a visual, auditory, kinesthetic, and tactual approach. Six months later Lee was reading as well as an individual eight months in the sixth grade (6.8) and was developing a marked interest in the social studies. Prediction led to verification and the acts of diagnosis were complete. The diagnosis can now be stated as follows.

Lee is a youth of high average intelligence who has been unable to make satisfactory progress in the language arts, especially reading, chiefly because of his failure to learn the basic word recognition skills. Conflicting teaching methods and frequent transfer from one school to another are primary causal factors. Frustration resulting from confusion in the classroom has contributed to Lee's maladjustment.

Diagnosis at any level is an ongoing process never complete until the accepted hypothesis has been proven beyond reasonable doubt. Diagnostic formulations based

upon the judgment of the clinician or the consensus of a clinical team are frequently unprovable because causal factors and dynamics of human behavior are not always susceptible to analysis. The proof of diagnosis in any case is adversely affected by a lack of control over a large number of variables.

Determining Consequential Factors

Consequential factors lead to the effect. They initiate a chain of reactions which finally produces the disability which is under investigation. A consequential factor may consist of one fact which stands alone, for example, a glandular dysfunction may initiate a sequence of factors related in a variety of ways which leads directly to the effect. In diagnosis these factors must be identified. Facts found simultaneously in several independent areas of investigation may be consequential. If, for example, both Binet test data and developmental history suggest mental retardation, this fact may be both material and consequential and lead directly to the disability under investigation. A constellation of factors all pointing to the same inference may be consequential. If, for example, several factors making up the developmental

history suggest retarded or arrested physical growth and development, this pattern of factors may be material and consequential and lead directly, or in a sequence of events, to the disability under consideration. A fact of known importance, based upon credited research, may be found to be consequential. Faulty vision, for example, can adversely affect reading achievement and in an individual case may lead directly to reading maladjustment.

Summary

The acts of diagnosis presented in this paper aid in the determination of relevant, material, and consequential factors in a clinical study. The clinician who follows through these acts thoughtfully and with a knowledgeable background of research findings in the field of reading will be better able to identify, interpret, and evaluate cause-effect relationships. These acts, which are not necessarily sequential, are restated as follows: Identification, Assumption, Rejection, Acceptance, Discovery, Explanation, Prediction, and Verification. The clinician with this model in mind will be able to determine more objectively that which is only relevant, that which is

material, and that which is consequential. Insignificant details can be swept aside, and a clearcut sequence of factors leading to the disability can become apparent. All of this should be completed before treatment and instructional measures are initiated.